Latency Reduction in Real-time GPS tracking in Android and the Web-based GPS Monitoring System

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Abstract:
The paper focuses on the research aimed to reduce latency in real-time GPS-tracking and implementation of a real-time web GPS-monitoring system based on Android devices that publicly provides access to users' locations. A real-time GPS monitoring system with low latency consists of three main components: a web front-end client, a server part, and an Android application. During the development process, the performance of WebSocket back-end frameworks was researched. The performance of Google Maps and Leaflet (OpenStreetMap) was compared to select the option which provides the best performance in the developed system. The conducted research and the chosen solutions for the implementation of the project made it possible to develop a system that shows high efficiency and performance. The developed software allows any user with an Android mobile device to share their location with others with minimal latency and show their location and traffic history.

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Keywords

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IEEE Keywords

Performance evaluation, Real-time systems, Internet, Servers, History, Low latency communication, Monitoring

Index Terms

Real-time GPS Tracking, Low Latency, Android Application, OpenStreetMap, Android Devices, Minimum Latency, Satellite, Operating System, Surveillance System, Local Data, End-users, Programming Language, Web Application, Mobile Network, Load Testing, User Location, Caching, Telegram, Increase In Response Time, HTTP Requests, Network Latency, Color Gradient, Polyline

Author Keywords

GPS, TLS, web application, Android, Google Maps, Java, PostgreSQL, PHP, nginx, Workerman, performance, low-latency

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